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09/621,407	07/21/2000	William J. Domino	013629.00030	4082

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EXAMINER	
MEHRPOUR, NAGHMEH	
ART UNIT	**PAPER NUMBER**
2617	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/621,407	DOMINO ET AL.	
	Examiner	Art Unit	
	Naghmeh Mehrpour	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC э 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-8, 11-23,** are rejected under 35 U.S.C. 102(e) as being anticipated by Rozenblit et al. (US Patent Number 6,658,237).

Regarding **claim 1,** Rozenblit teaches a system for transmitting and receiving data (see figure 8) comprising:

a direct-conversion receiver 310 receiving a signal modulated on a carrier frequency signal the direct conversion receiver 303 (see figure 8, col 18 lines 30-39) further comprising:

one or more sub harmonic local oscillator 311 mixers 522 (see figure 8, col 13 lines 55-67, col 14 lines 1-20),

a transmitter 300 coupled to the local oscillator 311 (see figure 8, col 18 lines 39-51).

Regarding **claims 2-3, 12-13**, Rozenblit teaches a method wherein mixing the carrier signal with the sub harmonic local oscillator signal to extract the base band signal further comprises:

a phase shifter 524 coupled to first subharmonic local oscillator mixer 522, where the output of the first subharmonic local oscillator mixer 522 is used to generate a quadrature signal of a phase shift 524 keyed signal (see figure 8, col 20 lines 3-21); and

a second subharmonic local oscillator mixer 523, where the output of the second subharmonic local oscillator mixer 523 is used to generate an in phase shift 524 keyed signal (see figure 8, col 20 lines 15-35).

mixing the carrier signal with the sub harmonic PLL (functions as a local oscillator) signal to extract an in-phase signal 524, phase-shifting 524 the sub harmonic local oscillator signal, and mixing the carrier signal with the phase-shifted 524 sub harmonic local oscillator signal to extract a quadrate phase signal (see figure 8, col 20 lines 3-15, lines 48-63).

Regarding **claim 4,** Rozenblit teaches a system comprising:

a low noise amplifier LNA 309 coupled to the phase shifter, wherein the signal modulated on the carrier signal is received by the low-noise amplifier and is transmitted to the phase shifter after being amplified (See figure 8, col 20 lines 15-30);

Regarding **claims 5-6,** Rozenblit teaches a system further comprising a frequency multiplier coupled between the local oscillator 607 and the transmitter 605 wherein the frequency multiplier (610/611) increases the frequency of the oscillator 600 (see figure 12A col 15 lines 65-67, col 16 lines 1-40).

Regarding **claim 7,** Rozenblit teaches a system wherein the transmitter comprises:

a frequency multiplier 610 coupled local oscillator 607 (col 15 lines 56-57, col 16 lines 1-40); and

an in-phase/quadraure modulator coupled to the frequency multiplier 610/611, receiving an in-phase modulation input signal and a quadrate modulator input signal, and outputting a quadrature phase shift keyed signal modulated at the multiplied local oscillator frequency (col 19 lines 50-67, col 20 lines 1-21).

Regarding **claim 8,** Rozenblit teaches system wherein the transmitter comprises:

an in-phase/quadrate modulator coupled to the local oscillator, receiving an In-phase modulation input signal and a Quadrate modulation (Rx Q) input signal, and outputting a quadrate phase shift keyed signal modulated at the local oscillator frequency (col 19 lines 50-67, col 20 lines 1-21); and

a frequency multiplier coupled 531 to the in phase/quadrate modulator and multiplying the frequency of the quadrate phase shift keyed signal (col 20 lines 3-57, col 23 lines 15-22).

Regarding **claim 11,** Rozenblit teaches a method for transmitting and receiving data (see figure 2) comprising:

receiving a carrier signal modulated with a data signal (col 12 lines 45-55);

mixing the carrier signal with a subharmonic local oscillator signal to extract a baseband signal (see figures 6, 8, col 12 lines 32-67, col 13 lines 1-5, col 14 lines 47-67);

multiplying the subharmonic local oscillator signal (col 13 lines 55-67, col 14 lines 1-20) ; and

modulating an outgoing data signal with the multiplied subharmonhic local oscillator signal (col 12 lines 15-32); and

a direct-conversion receiver receiving a signal modulated on a carrier frequency signal (col 13 lines 55-67, col 14 lines 1-10).

Regarding **claim 14,** Rozenblit teaches a method wherein modulating outgoing data signal with sub-harmonic local oscillator signal comprises:

multiplying the sub-harmonic local oscillator signal (col 14 lines 2-20, col 20 lines 30-46); and

modulating an outgoing in-phase data signal and an outgoing quadrature phase data signal with the multiplied sub-harmonic local oscillator signal (col 20 lines 47-63).

Regarding **claim 15,** Rozenblit teaches a method wherein the outgoing data signal with the sub-harmonic local oscillator signal comprises:

modulating an outgoing in-phase data and an outgoing quadrature phase data signal with the sub-harmonic local oscillator signal to generate outgoing data signal (col 20 lines 47-58); and

multiplying the modulated outgoing data signal to generate the outgoing data signal (col 20 lines 59-67, col 21 lines 1-27).

Regarding **claim 16,** Rozenblit teaches a method wherein modulating the outgoing data signal with the sub harmonic local oscillator signal comprises:

frequency modulating the sub-harmonic local oscillator signal during a transmit cycle (col 16 lines 65-67, col 17 lines 1-20, col 18 lines 37-50); and

interrupting frequency modulation of the sub-harmonic local oscillator signal during a receive cycle (col 18 lines 11-50, lines 65-67, col 19 lines 1-35).

Regarding **claims 17-18,** Rozenblit teaches a method further comprising opening a phase locked loop during the transmit cycle to lock the sub-harmonic local oscillator signal wherein modulating the outgoing data signal with the sub harmonic local oscillator signal (col 19 lines 14-35, col 24 lines 9-40).

Regarding **claim 19,** Rozenblit teaches a method wherein modulating the outgoing data signal with the sub harmonic local oscillator signal comprises:

modulating an outgoing in-phase data signal and an outgoing quadrature phase data signal with the sub harmonic local oscillator signal at a sub harmonic modulation index to generate a modulated outgoing data signal (col 16 lines 64-67, col 17 lines 1-20, lines 65-67, col 18 lines 1-21 lines 39-51); and

multiplying the modulated outgoing data signal by an inverse sub harmonic to generate the outgoing data signal (col 19 lines 50-67, col 20 lines 1-63).

Regarding **claim 20,** Rozenblit teaches a system for transmitting and receiving data comprising:

a low noise amplifier LNA 309 receiving a modulated incoming carrier signal having a carrier signal frequency (see figure 6, col 12 lines 15-67, col 13 lines 1-6, lines 45-55);

a local oscillator generating a signal having a subharmanic frequency of the carrier signal (col 12 lines 15-32);

a first mixer 527 coupled to the low noise amplifier LNA 309b and the local oscillator 518 the first mixer 527 receiving the modulated incoming carrier signal and generating an in-phase 529 incoming data signal (see figure 8, col 12 lines 45-55)

a second mixer 528 coupled to the low noise amplifier LNA 309b and the local oscillator 518, the second mixer 528 receiving the modulated incoming carrier signal and generating a quadrate phase incoming data signal 313 (see figure 8, col 20 lines 2-63); and

a modulator 301 coupled to the a local oscillator 302, the modulator receiving an outgoing data signal and modulating the outgoing data signal onto the a local oscillator 302 signals to generate an outgoing modulated carrier signal (col 20 lines 2-65);

a transmit amplifier 304 coupled to the modulator 301, the transmit amplifier amplifying the outgoing modulated carrier signal to a transmission power level (col 21 lines 50-63, col 23 lines 22-40, col 24 lines 20-40).

Regarding **claim 21,** Rozenblit teaches a system further comprising a general purpose computing platform coupled to the first mixer 500, the second mixer 501, and the modulator 301, the general purpose computing platform decoding an incoming data signal from the in-phase 503 incoming data signal and the quadrature phase incoming data signal, and generating the outgoing data signal (see figure 8, col 20 lines 47-66).

Regarding **claim 22,** Rozenblit teaches a system further comprising a telephone handset (signals from antenna 300) coupled to the first mixer 500, the second mixer 501, and the modulator 301, the telephone handset decoding an incoming data signal from the in-phase 503 incoming data signal and the quadrature phase incoming data signal, and generating the outgoing data signal (see figure 8, col 20 lines 47-57).

Regarding **claim 23,** Rozenblit teaches a system wherein an antenna directly connected to the low noise amplifier 309 and the low noise amplifier 309 is directly connected to the one or more sub-harmonic (col 18 lines 31-51).

Claim Rejections - 35 USC ∋ 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claim 10,** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rozenblit et al. (US Patent Number 6,104, 745)

Regarding **claim 10,** Rozenblit teaches a system wherein the transmitter comprises:

a modulator coupled to the local oscillator, where the local oscillator is modulated by the modulator (Col 22 lines 65-67, col 23 lines 1-22); and

a voltage-controlled reference oscillator 302 to the modulator 301, where the voltage-controlled reference oscillator is modulated by the modulator (see figure 6, col 12 lines 15-25, lines 65-67, col 13 lines 1-6col 19 lines 50-67, col 20 lines 1-2); and

a phase locked loop coupled to the local oscillator in a feedback loop, the phase locked loop further coupled to the voltage controlled oscillator (col 9 lines 30-38, col 19 lines 7-27). Rozenblit fails to teach the modulator is a frequency modulator. However, Examiner takes official notice that a frequency modulator is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the above teaching with Rozenblit , in order to determine a signal content of the message by the deviation of the carrier frequency.

3. **Claim 9,** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rozenblit et al. (US Patent Number 6,104, 745) in view of Bickley (US Patent Number 5,152,005).

Regarding **claim 9,** Rozenblit teaches a system wherein the transmitter comprises:

a frequency modulator coupled to the local oscillator, wherein the local oscillator is modulated by the frequency modulator (col 19 lines 10-14);

a phase locked loop coupled to the frequency modulator and the local oscillator (col 19 lines 14-27); and

a switch coupled between the local oscillator during a transmit cycle and can decouple the phase locked loop from the local oscillator during a receive cycle (col 19 lines 66-67, col 20 lines 1-35, col 24 lines 10-40).

Rozenblit method switches the transmitting and receiving cycle (col 19 lines 14-27). Rozenblit fails to specifically mention that a switch coupled between the local oscillator and the phase locked loop, wherein the switch can couple the phase locked loop to the local oscillator during a transmit cycle and can decouple the phase locked loop from the local oscillator during a receive cycle. However, Bickley teaches a synthesizer that switch 55 coupled between PLL 250 and a local oscillator 31, wherein the switch 55 can couple the phase locked loop 250 to the local oscillator 31 during a transmit cycle (see figures 1, 2 col 4 lines 4-11, col 8 lines 15-21) and can decouple the phase locked loop 250 from the local oscillator 31 during a receive cycle (see figures 1, 2, col 4 lines 67-68, col 5 lines 1-6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the above teaching of Bickley with Rozenblit , in order to reduce the LO leakage from the receiver to the antenna, for the purpose of reducing interference.

Response to Arguments

4. Applicant's arguments filed 8/30/07 have been fully considered but they are not persuasive.

In response to the applicant's argument that "*Rozenblit fails to teach a direct-conversion receiver receiving a signal modulated on a carrier frequency signal, the direct-conversion receiver further comprising one or more subharmonic local oscillator mixers, a local oscillator coupled to the direct conversion receiver coupled to the direct conversion receiver, the local oscillator generating a signal having a frequency equal to a subharmonic of the carrier frequency signal; and transmitter coupled to the local oscillator.*"

The Examiner asserts Rozenblit teaches the frequency different between the transmit and receive bands is a fixed carrier signal, and can vary within a predetermined frequency range.

Rozenblit teaches the translation loop upconverter is configured to increase the carrier frequency of the output of the quadrature modulator so that it is at the appropriate frequency for transmission. In the case of DCS, the transmit band is 1710-1785 MHz. In the case of GSM, the transmit band is 890-915 MHz. The appropriate frequency for transmission is the selected channel within the appropriate transmit band, which has a frequency equal to that of the selected channel in the receive band minus the frequency offset for the band. In two configurations, the output of the PLL is shared by the translation-loop upconverter in that a signal derived from the output from the PLL is provided to the filtered LO input of the downconversion mixer in the translation loop upconverter. In the case of the GSM band, the PLL output is applied directly to the filtered LO input of the mixer. In the case of the DCS band, the PLL output, after passage through the doubler, is applied to the LO input of the mixer. A related method of providing full duplex transmission and reception is provided which comprises the following steps: selecting a band from a plurality of bands; receiving a signal at a channel within the selected band, the channel having a frequency; directly converting the signal to a baseband signal using a first signal derived from a local oscillator signal, the first signal being an nth subharmonic of the channel frequency, wherein n is an integer greater than 1; upconverting a second baseband signal to a transmission frequency; and transmitting the upconverted signal.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. **Any responses to this action should be mailed to:**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naghmeh Mehrpour whose telephone number is 571-272-7913. The examiner can normally be reached on 8:00- 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Appiah be reached (571) 272-7904.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NM

November 27, 2007

NAGHMEH MEHRPOUR
PRIMARY EXAMINER